NASA Acquisitions Pollution Prevention Office
Kennedy Space Center, FL 32899

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Studies, Reports, and Recommendations in Support of the NASA Acquisition Pollution Prevention (AP2) Program at the John F. Kennedy Space Center (KSC), FL

Status Report #1
July 02, 2003

NASA Contract: NAS10-03029
Task Order No. 1

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Executive Summary

NASA Headquarters established the NASA Acquisition Pollution Prevention (AP2) Program Office in 1998 to help NASA Enterprises Programs and Centers qualify and implement replacement materials and/or processes that reduce or eliminate the uses of hazardous materials (hazmats). To accomplish this mission, the NASA AP2 Program operates in three distinct business entities:

- Agency,
- NASA/DoD,
- NASA/International.

As the support contractor to the AP2 Office, ITB staff provide engineering, technical and administrative program and project management support to the AP2 Program Manager. This Status Report covers ITB's performance and accomplishments under Task Order No. 1 for the period April 19 to June 30, 2003.

ITB provided core program support across all three business entities (NASA, DoD, International). Activities included but were not limited to:

- Efforts required to complete appropriate research, program and project development;
- Analyses, risk and quality assessment;
- Strategies planning;
- Information management;
- Outreach;
- Customer relations;
- Website development and maintenance.

In supporting Agency Business, ITB developed a number of technical thrust areas and candidate P2 projects involving the NASA community. Individual project ideas were scoped to address specific applications with the intent to identify five (5) P2 projects to execute. Five (5) teleconferences were set up and held with potential NASA stakeholders between April and June to begin scoping the projects. ITB made major strides in establishing or enhancing the rapport with many NASA Centers and communicating a desire of the NASA AP2 Program Office to work together to solve common problems.

In supporting the DOD Business Entity, ITB provided significant support to the Joint Group on Pollution Prevention (JG-PP) in its efforts to maintain environmental technology cooperation, and qualify shared alternative material and process solutions that are less or non-hazardous to the environment. A major effort was ITB's support as the Project Integrator in the completion of the Technical Phase of the JG-PP Lead-Free Solder project and the start of the Business Phase. The Lead-Free Solder Joint Test Protocol is complete. The business plan is now in place to allow testing materials to begin to be purchased. Other support to JG-PP involved continuous improvement of the JG-PP methodology to facilitate the identification of potential new projects.

In support of the International Business Entity, ITB continued to support the Portuguese Institute of Environment and Centro Para Prevenção da Poluição – C3P (English translation: Center for Pollution Prevention) under the NASA/Portugal Joint Statement (JS) and the Terms of Reference (TOR). Significant ITB efforts were expended this reporting period establishing C3P as a viable program. For example, Mr. Hill provided an extensive amount of support in working programmatic efforts between the NASA AP2 Program and the C3P, who is the delegated element of the Portuguese Institute of Environment (IE) to identify Portuguese P2 needs and facilitate joint NASA/IE P2 projects.

Summary Report

To accomplish its mission, the NASA AP2 Program operates in three distinct business entities:

- Agency,
- NASA/DoD,
- NASA/International.

The AP2 Office provides engineering, technical and administrative program and project management support. Projects may be exclusive to each business entity or shared by two or more in keeping with the Program's mission to identify common environmental issues and work collectively to find solutions that reduce duplication of effort, costs and technical risks. The result will be a reduction in the Total Cost of Ownership of space systems to the Government. NASA acquisition and sustainment activities will be positively impacted under this task.

This Status Report for the NASA AP2 Program covers the period April 19, 2003 through June 30, 2003. As a minimum, this reports addresses the following items:
a). Summary of ongoing and planned activities related the NASA AP2 Annual Task Plan
b). Status of program and progress of work, noting existing or potential problem areas in meeting NASA AP2 Annual Task Plan expectations and,
c). Identification of reports, trip reports, meeting minutes and presentation materials provided

A. Core Program Support

Core program support activities are shared across and benefit program business entities (NASA, DoD, International). Activities include but are not limited to:

- Efforts required to complete appropriate research, program and project development;
- Analyses, risk and quality assessment;
- Strategies planning;
- Information management;
- Outreach;
- Customer relations;
- Website development and maintenance.

1. Staff

The knowledge, skills, and abilities of the ITB contractors supporting the NASA AP2 Office the Program to meet its mission of helping NASA Enterprises Programs and Centers qualify and implement less or non-hazardous materials or processes. A staff of seven (7) ITB personnel comprised the contractor support to the NASA AP2 Office during the reporting period: Mr. Robert Hill, Mr. Brian Greene, Mr. Kevin Andrews, Mr. Kurt Kessel, Mr. Matt Rothgeb, Ms. Tess Hill, and Ms. Cassandra Carroll. These personnel interfaced with senior NASA and DoD program and technical representatives, international executives, scientist, engineers, and numerous subject matter experts in support of the NASA AP2 Program and its projects.

2. Regulatory Support

ITB is occasionally called upon to review and determine the applicability of local, state and federal regulations, Executive Orders, NASA guides and handbooks and international policy as they pertain to the AP2 Program. During this reporting period, ITB performed the following regulatory support:

- Provided support to the revision of the NASA HQs Code JE P2 NPG
- Supported the beginning developments of NASA HQs' Sustainable Development Program
- Revised the Acquisition Pollution Prevention Handbook
- Reviewed applicable regulatory and standards documentation for prospective projects with Portugal (e.g., Directive 1999/13/CE, Regulation DL nº 242/2001, Decree Law (DL) 352/90, Regulating Ordinance nº 286/93)

Ms. Hill recommends medias of information relative to international policy subject to Section

E: International Business Entity Support, C3P, be noted to include: Copies or original executed documents, such as, NASA/Portugal Joint Statement (JS) and the Terms of Reference (TOR) be maintained under the Document Control System (DCS) process.

3. Business & Financial Plan Development

ITB is responsible for developing business and financial plans for the support of the NASA AP2 Program Office. Ms. Hill noted ITB obtains supplies from vendors outside Kennedy Space Center. Relative to technical support, Ms. Hill requests from ODIN: periodic toner cartridges for the network printer, ODIN KSC 000708, located in Headquarter (HQ) Building, Room 3481; 4/23/03 requested email account, computer and monitor for Cassandra Carroll, located in HQ, Room 3481.

On 6/09/03 Ms. Hill contacted Alice Johns, Space Gateway Support (SGS), KSC to request a work order for the following: Move from cubicle #3481C and move to cubicle #3481B: 1 filing cabinet and 1 4 ft. refrigerator. The objective of the request is to accommodate the contractor new hire to start on July 7, 2003.

On 6/10/03, Ms. Brown notified Ms. Hill that the work order needed to be canceled due to NASA reorganization within Room 3481. Ms. Hill notified Ms. Johns with the request to cancel.

On 6/20/03, Mr. Kurt Kessel and Ms. Cassandra Carroll removed the MSDS files from the NASA AP2 office to the ITB South Office, 2460 N. Courtenay, #101, Merritt Island, FL 32953.

4. Status Reports and Schedules

ITB routinely prepares presentations and status reports. During this period, ITB

- Maintained a master schedule of program activities,
- Maintained appropriate documentation and recordkeeping, e.g. calendars, meeting agendas, minutes, and action tracking.
- Prepared draft presentations, established and maintained a presentation library.

The following paragraphs provide further details of these activities:
On 4/21/03, Ms. Hill created a master schedule of program activities tool in MS Excel. The tool includes NASA, DOD, and International program and project telecons, meetings, and conferences and other events involving the NASA AP2 Program Office. On 4/24/03, Ms. Hill met with Ms. Christina Brown, NASA AP2 Program Manager to review the tool. Ms. Brown approved the tool, called the Calendar of Events. Ms. Hill maintains the calendar by sending out weekly data calls to the NASA AP2 staff for input. A weekly updated electronic and hard copy is provided to Ms. Brown.

For this reporting period the following were identified and tracked using the Calendar of Events tool:

Teleconferences: 8 projects, 3 JG-PP WG, 1 SEA

Face to face Meetings: 1 JG-PP; 1 JG-PP LFS Business Meeting, 1 SEA; 1 final site visit (Support Equipment), 1 project site development visit (International – C3P) Specific Trip reports are available upon requests.

Conferences: (1) Aerospace Coatings Removal and Coatings Conference (2) Air and Waste Management Association (A&WMA). Specific Trip reports are available upon requests.

The Calendar of Events is available upon request for specific dates of events, telecons, meetings, etc. Also, refer to the Calendar of Events, History Page for historical data relating to additions, deletions, and changes associated with supporting events. The program and project events are noted on the NASA AP2 web site.

During this reporting period, Mr. Hill initiated the development of a Document Control System

(DCS) to maintain documents and record keeping of calendar, meeting agendas, minutes, briefings, abstracts, presentation library, and other programmatic supporting documentation. The DCS is nearly complete and is anticipated to be fully operational during the next reporting period.

Ms. Hill prepared for Ms. Brown the following: Two presentations packages (1) NASA Environmental Managers Panel Meeting and (2) A&WMA. Ms. Hill also reviewed and prepared the integration of numerous agenda, presentations, funding workbook, and project development into one comprehensive package for the JG-PP WG Meeting.

5. Program Information Management Systems

ITB maintained various information management systems during this reporting period, including an action item tracking tool, calendar of events, and other tools to track and integrate business and technical activities.

Calendar of Events: Ms. Hill created the calendar tool (see Section 4), that lists various information for program and project technical activities in all three-business entities (1) Center (2) DOD and (3) International. As noted in Section 4, the tool is updated weekly.

Project Information Workbook: On 5/13/03 and 6/4/03, Ms. Hill updated the Project Information workbook that includes the business entity project, date, status, and point of contact. The next call for updates is scheduled for 7/3/03.

On 5/12/03, Ms. Brown requested a copy of the workbook be furnished to Mr. David Amidei, NASA HQ, Code JE. Ms. Hill presented a computer disk (CD) with the subject information to Mr. Amidei at the SEA meeting on 5/14/03.

Mr. Rothgeb has begun to develop and populate a database for all documentation and presentations that are created for the AP2 Office. This system will allow for easy reference to current and past documentation and a universal code system for identification and cross-reference.

6. Web Sites

Ms. Cassandra Carroll maintains the NASA AP2 Program Office website at http://www.acgp2.nasa.gov. During this reporting period ITB support initiated the development of the C3P website at http://www.c3p.org. In addition, ITB is tasked by the NASA AP2 Program Manager to monitor and provide update the JG-PP Website at http://www.jgpp.com.

NASA AP2 Web Site Accomplishments

Development of the upgraded NASA AP2 web site continued in April 2003, with bi-weekly review meetings with the NASA AP2 program manager, Christina Brown. New web site features include; information regarding Agency, JG-PP and C3P activities, links to many valuable Pollution Prevention sources, and also details of program and project calendar events. The web site was approved for launch in early May 2003 for a peer review and testing. Final format and content approved by Ms. Brown for the web site on May 30, 2003. Ms. Carroll and Ms. Brown will continue meetings on a monthly basis to ensure that all Task Order objectives are being met and exceeded.

Ms. Hill provided analysis support and review of the NASA AP2 web site and made specific recommended changes to content and format throughout the site: 4/21/03, 4/28/03, 4/29/03, 5/8/03, 5/9/03, 5/13/03, 5/30/03. On 5/6/03, Ms. Hill reworded the Overview page and Ms. Brown approved the revision on 5/9/03. On 5/12/03, Ms. Carroll loaded the revision. On 5/19/03, Ms. Hill reworded the Methodology chart and Ms. Brown approved the revision on 5/30/03. On 5/30/03, the approved subject methodology was submitted to Ms. Carroll.

It is noted that the NASA AP2 website visibility is limited by NASA firewalls from access from outside the .gov or .mil sources.

NASA/Portugal International Information Exchange Web Site Accomplishments
During this reporting period, the contractor provided initial development of the C3P Web site, with Macromedia Flash enhancements uploaded to the web site on May 8, 2003. The contractor received edits and comments and made adjustments accordingly. Updates were made to the Events page as needed. Web site links include reference to the NASA AP2 web site to foster information exchange. Initial development of the website by ITB is complete. ITB will provide maintenance and updates to this website as provided by the C3P Director General, or other appointed C3P representatives and as required labor is approved by the NASA AP2 Program Manager, Ms Christina Brown.

7. Integrated Technology Database

Integrated Technology Database (ITDb) was developed to aggregate and track NASA Enterprise and Center, military services, and international allies P2 needs and projects. Now per this IDIQ contract, Task Order #1, ITB is to web-enable the ITD. Mr. Kevin Andrews (ITB) was assigned as Project Manager on this effort and is supported by Mrs. Cassandra Carroll (ITB). To meet the NASA protocol requirements for web enabling databases under Cold Fusion, ITB entered into a sub-contract with Consultis of Orlando Florida to accomplish the web enabling of the ITDb Access Database.

On 5/13/03 Mr. Andrews hosted a Project Kick-off meeting to define how the assembled team would work together to accomplish the goals of this project, define the roles and responsibilities of each individual, and establish a project schedule by which to assess progress and identify critical decision-making nodes. Present at the meeting was Cassandra Carroll and Wade Bee (Consultis). The meeting provided a forum to discuss the project methodology and to address the following technical queries:

1. Location of server (KSC or ITB-South)
2. Server-side language: Cold Fusion (version?)
3. Client-side environment: HTML, DHTML, (Macromedia Flash?)
4. Target browser: (IE, Netscape?) (version?)

In concluding the meeting Mr. Andrews indicated that he wanted Ms. Carroll be as familiar with the web-integration process as possible, since she would be the administrator of this tool and tasked with performing routine maintenance activities, Mr. Bee concurred on the benefits of this idea.

On 5/22/03 Mr. Andrews hosted ITDb telecon No. 2 on above subject to address project progress as well as to address any technical or logistic concerns on the part of Consultis. Herein the following requirements were identified:

Hardware -
-- 1.5Ghz or faster processor (dual processor preferred)
-- 2Gb or more main memory
-- 10ms or faster hard drive with 40Gb or more capacity

Server Operating System - Windows Server 2003-WebServer Edition w/ IIS 6.0
Database Server - Microsoft SQL Server 2000 Desktop Engine (MSDE)
Server-side Language - Cold Fusion MX

On 5/29/03 Mr. Andrews hosted ITDb telecon No. 3 on above subject to address project progress. Herein it was identified that for the ITDb to operate in Windows Server OS 2003 and Database Server MSDE and get the associated benefits, the NASA AP2 Office would have to purchase a Server 1 Seat from ODIN and install Server OS 2003. ODIN would provide minor routine support for this seat, but ITB, Inc. would be ultimately responsible. Mr. Andrews and Mrs. Carroll are currently exploring whether to locate the server on-site or off-site and comparing the operational and financial implications of server location.

On 05/30/03, Mr. Kevin Andrews hosted an ITDb meeting with Mrs. Christina Brown (NASA) and Mrs. Cassandra Carroll to:

1. Brief Mrs. C. Brown on the status of this effort.
2. Provide a review of hardware and server requirements juxtaposed to support currently provided under the ODIN/NASA agreement.
3. Obtain approval to proceed with migration to Server OS 2003 and Server Engine MSDE.

Herein Mr. Andrews addressed the progress on the Integrated Technology Database (ITDb) web-enabling project. Mrs. Brown iterated that ITDb has to be accessible to Agency, DOD and external customers outside of the government security firewall.

Mrs. Brown stated that development efforts should continue in Windows Server OS 2003 and Microsoft SQL Server 2000 Desktop Engine (MSDE) but required that the project team should focus not only on web-enabling the current application but should also evolve the application into a more robust and usable tool that allows for real-time updating and multiple data-entry ports. The evolved tool should provide a mechanism for users (across multiple elements) to readily identify common needs and available solutions and thus facilitate dem/val of new technologies using joint partnerships in the domestic and international arena. Mrs. Brown stated that the ITDb must be able to match P2 needs to solutions and current projects/partners and thus provide a valuable tool to its users by saving time and money.

On 6/05/03 Mr. Andrews hosted ITDb telecon No. 4. the purpose of the meeting was to address progress on the current effort and to ensure that the project was evolving as per the requirements outlined by Mrs. Brown. Mr. Bee stated that he was making good progress but that he was currently one day behind schedule and plans to work on Friday 06/06 in order to return to schedule.

On 6/05/03 Mr. Andrews hosted ITDb telecon No. 5, herein Mr. Andrews indicated that he would like the cost and status data to link to the score of each project, possibly as a PDF file as a link on the server. Mr. Bee inquired as to what level of user (Super user, Administrator, Analyst, or Public (read only)) should permission to add or update project information be granted. Mr. Andrews replied that this should have Administrator level permission but that the system should offer the ability to grant Analyst data input rights.

8. Customer / Stakeholder Interaction

ITB personnel routinely conduct internal and external meetings and other communications to track program/project status, complete action items, and assure customer satisfaction. Ms. Hill maintained and updated the following contact distribution lists:
Lead Free Solder Distribution List: updated on the following dates: 4/29/03, 5/20/03, 6/2/03, 6/3/03, 6/6/03, and 6/11/03. The list holds 188 participants.
JG-PP WG: updated on 6/3/03. The list holds 32 participants.

ITB continued to update the project points of contact list for each NASA Center. As projects develop, individual stakeholder lists will be generated for that specific project. The general listing of contacts within NASA Centers is updated as new contacts or change of contact information is made available.

B. Agency Business Entity

During this reporting period, ITB identified, analyzed, and prioritized Center and Enterprise pollution prevention needs. The result has been the recent development of a number of technical thrust areas and candidate P2 projects within the NASA community and with other external sources. A major focus of this reporting period was the scoping of these technical areas and candidate projects for specific applications to soon arrive at up to five P2 projects to execute. ITB made major strides in the last few months in establishing or enhancing the rapport with many NASA Centers and communicating a desire to work together to solve common problems.

1. Professional Networking

ITB developed and maintained professional networks with all NASA Centers, major field installations, and Enterprise Program offices to help identify potential joint projects.

During this reporting period, ITB developed a master matrix of NASA center environmental points of contact. A more specific list of facility points of contact for high-priority AP2 candidate projects has also been established and is being updated continuously.

On April 25, 2003, Mrs. Brown and the NASA AP2 engineers (Greene, Andrews, Kessel and Rothgeb) met with representatives from United Space Alliance (USA-M&P) to discuss pollution prevention technologies of common interest and to examine where opportunities for teaming exist. Paul Hayes (USA-M&P) presented some ideas for potential JG-PP (or NASA) projects and provided an update on the Nitrocision liquid nitrogen depainting technology. The following technologies were discussed at this meeting

- Liquid Nitrogen Depainting.
- Laser Shearography for TPS.
- Non-Lead Dry Film Lubricant for High-Load Applications.
- Cold Spray.
- Organic Corrosion Inhibitor for Paints.
- Convergent Spray Technology.

From this meeting, Mr. Andrews was actioned to:

- Compare the technical requirements of the USA non-lead dry film lubricant project against the requirements of the Air Force's non-lead dry film lubricant project.
- Provide information of the Air Force non-lead dry film lubricant project to USA

2. SEA Support

ITB staff, particularly Mr. Andrews and Mr. Greene, actively interfaced with members of the Shuttle Environmental Assurance (SEA) Initiative to offer technical knowledge relevant to SEA activities and studies for P2 Project development.

The NASA AP2 Office attended the SEA face-to-face meeting on May 14-15 to identify needs across Shuttle Elements and work toward common solutions for those elements. All ITB engineers from the NASA AP2 Office-KSC attended, as well as Mr. Robert Hill and Mrs. Tess Hill. Kevin Andrews and Brian Greene actively supported the conference by presenting slides on current NASA AP2 efforts and the status of the Lead-free solder project, respectively.

Kevin Andrews has been identified as the lead contact for NASA AP2 support to the SEA. In this capacity Mr. Andrews will support SEA telecons and Face-to-Face meetings and provide technical input to the group on issues related to present and future shuttle P2 concerns. Mr. Andrews is currently working with SEA members to address chrome P2 needs in shuttle processing.

3. New Agency Projects

With a NASA AP2 goal is to begin five (5) Agency projects in 2003, ITB began actively working with various NASA Centers to develop specific projects in the common needs areas identified from the Pollution Prevention Opportunity Needs Assessments (PPONAs). The PPONAs allowed ITB to identify the following four technical categories for which AP2 personnel would work to develop specific Agency projects:

- Machining and cutting fluids
- Painting and de-painting
- Wiping and cleaning
- Aerosols.

After identifying the four focus areas, ITB continued expanding upon the list and re-prioritizing the P2 opportunities based on new information from Agency and DoD technical personnel.

This resulted in a revised listing of potential Agency P2 projects. This listing continues to be revised. A detailed project matrix showing the risk and prioritization of known P2 project opportunities is available upon request. Following is a list of some of the more promising potential projects at this time:

- Non-ODC Replacements for CFC 113 in Line Cleaning Applications
- Low Emission Depainting Practices
- Dem/Val of Alternatives to Aliphatic Isocyanate Urethanes
- Dem/Val of ICP as an additive to promote corrosion protection
- MCC-1 Convergent Nozzle

Following is a summary of accomplishments in the four P2 project categories previously identified via the PPONAs:

a. Machining and Cutting Fluids - Lead: Kurt Kessel

1) Product substitution and process improvements targeting EPA Priority Chemical reductions in machining fluids. This P2 need was incorporated into the Project Summary Plan, " Technology Transfer: Metalworking Fluids Recycling "

2) Technology migration to reduce EPA Target Chemical and ODS used in Metal-Working Fluids. This P2 need was incorporated into the Project Summary Plan, " Technology Transfer: Metalworking Fluids Recycling"

b. Painting and De-Painting - Lead: Kevin Andrews/Matt Rothgeb

Thrust Area Kickoff Meeting

On April 30, 2003, Mr. Andrews hosted a telecon to address potential projects in Coating and Depainting. The purpose of the telecon was to examine the potential for teaming related to Coating and Depainting processes across NASA and to begin defining overall goals and requirements of NASA stakeholders.

Structures at Kennedy, Ames, Langley, Stennis, Dryden etc. cover millions of square feet and must be maintained with scheduled and unscheduled maintenance activity. While there has been some attempt to embrace non-hazardous chemicals/materials and processes in coating and depainting operations this has in large been fragmented with varying degrees of success across NASA. Consequently, a teaming effort across NASA will leverage successes and identify opportunities of mutual benefit.

Materials and processes will be evaluated with the goal of selecting the processes that will improve corrosion protection at critical systems, facilitate easier maintenance activity, extend maintenance cycles, eliminate flight hardware contamination and reduce the amount of hazardous waste generated across NASA.

Mr. Greene also provided support at this project teleconference and addressed the overall project flow and methodology. Mr. Greene discussed the JG-PP methodology for managing projects and the benefits that stakeholders can expect.

This telecon identified five specific areas worthy of further exploration

1. Identification, testing and validation of alternatives to inorganic zinc primers in moderately and highly corrosive environments.
2. Identification, testing and validation of alternatives to Aliphatic Isocyanate Urethanes.
3. Identification, testing and validation of “newly” identified coating systems in facility applications. E.g. IPN based coatings, low-VOC topcoats, heat-resistant coatings.
4. Review of current depainting and surface preparation requirements for structural steel.
5. Identification, testing and validation of “new” surface preparation/depainting technologies; *The goal being to;*
   - *reduce the quantity of secondary waste*
   - *reduce fugitive emissions and dust generation*
   - *achieve an acceptable surface profile*

Painting/De-painting Scoping Teleconferences

On Wed. May 5, 2003, Mr. Andrews hosted telecon No. 2 for this subject area. The purpose of this telecon was to address the following issues:

1. To examine “where we go from here” on identified project focus areas and to map out a strategy for collecting relevant data from stakeholders on performance and testing requirements.
2. To define a mechanism for communicating with other centers regarding common issues and opportunities for teaming.

Mr. Andrews emphasized the importance of partnership and team cooperation in leveraging resources and reducing risk as we address common needs across NASA.

Mr. Andrews mentioned that the action items from the previous telecon were still open and requested that if the due dates were too aggressive, that the group indicate as such. Mr. Andrews also discussed his recent participation in the surface coatings and depainting conference in Colorado Springs, CO. as well as some contacts that were made within JSC, NASA HQ (Code J), and DoD elements; NAVAIR, Air Force, and Navy that have all expressed interest in this project and may wish to team on this effort. Mr. Andrews mentioned that representatives of NASA HQ Code J have indicated their willingness to assist in gaining momentum within other NASA centers for both this and other Joint-NASA P2 projects. Mr. Andrews indicated that these projects are NASA-wide concerns, and that the benefits of teaming and working together on these efforts should be an agency goal.

Mr. Andrews requested that telecon participants keep in contact with him over the next two weeks to address the action items and to begin working toward mapping out the JTP and identifying the testing requirements and procedures. Mr. Andrews expressed the importance of identifying the internal needs of NASA in this area before taking it to Navy, Air Force or other Agencies to determine their interest in participating in the project. Mr. Andrews request input from stakeholders in order to generate the JTP and PAR.

The group scheduled the next telecon for July 9 to address which projects to initiate first and to properly scope the JTP.

The following potential painting/de-painting project ideas were previously identified via the PPONAs.

1) Substitution of Ketone solvents in surface preparation process. This P2 need has not been incorporated explicitly into any current Project Summary Plan. It has not generated the interest that other depainting ideas have.

2) Substitute Methylene chloride in paint stripping processes. This P2 need has not been incorporated explicitly into any current Project Summary Plan. It has not generated the interest that other depainting ideas have.

3) Waste minimization using alternative surface preparation technologies. This P2 need was incorporated into the Project Summary Plan, "Coating and Depainting of carbon steel in structural applications"

4) Assist in Convergent Spray Technology migration.
   Potential Project Kickoff Meeting
   Mr. Rothgeb held a teleconference on May 20; its purpose to scope the technology transfer of Convergent Spray Technology (CST) to Michoud Assembly Facility (MAF) to replace currently used methods of Super Light Ablator (SLA) application. During this initial teleconference, the AP2 Methodology was outlined for the group highlighting some initial steps that were to be accomplished before the next

teleconference. OEMs from USA-SRB were present at the telecon as well as engineers involved with the current spray application of SLA at MAF.

The meeting identified the SLA testing that had taken place in the past and the probability that a project of this type would be possible at this time. Actions were given to stakeholders at MAF, Marshall Space Flight Center and to KSC-USA-SRB to define the specifications required to test and qualify the new method of application.

A Project Summary Plan has been prepared for this candidate project, and the document was approved by Ms. Brown, NASA AP2 manager, on April 24, 2003.

c. Wiping and Cleaning - Lead: Kurt Kessel (w/ Kevin Andrews support)
A Project Summary Plan was prepared for the Precision Cleaning technical thrust area and incorporated four technical project areas (discussed below) for further development. Permission for ITB to begin further development of one or more precision cleaning projects was received on March 14, 2003 via Ms. Brown's approval of the Precision Cleaning Project Summary Plan.

Thrust Area Kickoff Meeting
On April 16, 2003, Mr. Andrews hosted a non-ODC Precision/Line Cleaning teleconference. The purpose of the telecon was to examine the potential for teaming on non-ODC Precision/Line Cleaning projects (s) and to begin defining overall goals and requirements of NASA stakeholders.

Kurt Kessel supported this meeting with input from Mr. Robert Hill. During the telecon a summary of the NASA AP2 methodology was presented to the participants and the overall goal and benefits of teaming was explored. Stakeholders from various NASA centers identified their current needs in this arena and Mr. Andrews lead an open discussion to address how best to team on resolving common P2 needs.

This telecon identified four primary areas that would benefit from a joint effort and yield reduced stakeholder risk (technical, financial etc.). The telecon was successful in identifying four sub-categories worthy of further investigation.

PC.I.	Replacement of currently used ODCs in clean-room applications
PC.II.	Dem / Val of HFE 7100, Vertrel and Aqueous systems for replacement of CFC 113 in line cleaning applications
PC.III.	Dem / Val of alternatives to AK 225
PC.IV.	Replacement of TCE and TCA in Calibration testing - Here liability and Industrial Hygiene is an additional concern

Consequently, it was identified that each of these “projects” would require a specific project team comprised of stakeholders and ITB technical staff. These project teams will be instrumental in scoping the project, identifying performance and testing requirements and ensuring that NASA agency or center needs are addressed.

Scoping Teleconferences
On June 19, 2003, Mr. Greene and Mr. Kessel hosted Telecon #2 for this subject area. The purpose of this telecon was to confirm the participant’s interest in the four identified project areas. Unfortunately, NASA stakeholder attendance was poor—only White Sands and Stennis attended, and the Stennis participant was just a “stand in”. The telecon was also used to begin collecting requirements for the JTPs. Mr. Kessel requested that all interested parties submit their precision cleaning process documentation along with all relevant specification documents by July 4, 2003. A consolidated specifications matrix will be generated for discussion by the group.

The following potential precision cleaning project ideas were previously identified via the PPONAs.

1) Dem/Val Non-Chromium Alkaline Cleaner for Aluminum. This P2 need was incorporated into the Project Summary Plan, "Non-Chromium Alkaline Cleaner for Aluminum Substrates"

2) Dem/Val of a non-hazardous alternative (obsolescence risk) used in precision cleaning to reduce the use of ODS in oxygen-line systems and non-oxygen line systems. This P2 need was incorporated into the Project Summary Plan, "Non-ODC Precision and Line Cleaning systems"

d. Aerosols - Lead: Matt Rothgeb

1) Product and transfer media substitution to reduce VOC emissions. This P2 need was incorporated into the Project Summary Plan, "Aerosol Alternatives and Waste Reduction"

2) Dem/Val NJIT Membrane Technology as a means of reducing VOC emissions. Mr. Rothgeb is in contact with Applied Membrane Technology (AMT), the company that has taken over production of the membrane technology. Mr. Rothgeb discussed the interest that both NASA and foreign partners in Portugal have in reducing VOC emissions as well as the type of processes that are typically seen throughout NASA. Mr. Stephen Conover, and Mr. Stefan Muench are interested in developing and testing the technology again with NASA in an environment that is more applicable to NASA's needs. They are currently preparing a PowerPoint presentation that will further outline the uses and limitations of their filtration system.

Mr. Rothgeb discussed the possibilities of working together with AMT to further test the system, and the need to identify the areas that this technology will most likely impact before moving forward with any testing. Mr. Rothgeb hopes to identify industries within Portugal that may also have industrial processes that can utilize this technology in order to make a higher probability of project success and in order to have more stakeholders involved in the dem/val process.

Mr. Rothgeb will be coordinating with AMT to organize a teleconference or face-to-face meeting in early July after stakeholders within NASA, DOD and C3P have been identified.

A Project Summary Plan has been prepared for this candidate project for approval by the NASA AP2 Program Manager.

4. Migration / Joint NASA / DOD Projects

ITB routinely monitors and participates in JG-PP and other DoD P2 projects for applicability to NASA programs and process with the idea to maximize NASA participation and technology migration of completed and on-going projects. The following P2 areas are of prime interest:

a. Nonchromate Coating Systems

Mr. Greene and Mr. Andrews have offered assistance to SEA in developing a NASA project for nonchrome conversion coatings and primers. Shuttle Elements are awaiting funding before proceeding with any scoping efforts.

Mr. Andrews is currently providing limited support to the JSC T-38 fleet maintenance team and is assisting in the identification of a non-chrome conversion coating.

b. Lead-Free Solder for Electronic Circuits and Components

Mr. Greene and Mr. Kessel continued to keep key personnel from NASA Centers, especially MSFC and JPL, actively involved in the ongoing JG-PP Lead-Free Solder project. In addition, ITB kept in touch with technical efforts that NASA has underway with lead-free organizations such as CALCE.

c. Alternatives to Cadmium for Corrosion Protection and Threaded Part Lubricity Application (BISDS)
Mr. Greene and Mr. Andrews have offered assistance to the Shuttle Environmental Assurance (SEA) Initiative in developing a NASA project for alternatives to cadmium that would build upon the JG-PP cadmium project. Shuttle Elements are awaiting funding before proceeding with any scoping efforts.

d. Low/No VOC and Nonchromate Coatings System for Support Equipment
Mr. Andrews has received the Potential Alternatives Report for the upcoming ICBM project from Susan Misra (Air Force). This PAR will be reviewed as to whether any of the coating systems herein identified are applicable for NASA applications.

e. Non-ODC Oxygen Line Cleaning
Mr. Andrews and Mr. Kessel are working closely with Glenn Research Center, Langley Research Center, and other Centers to possibly migrate one or more of the Air Force/Versar oxygen line cleaning systems to NASA. A Precision Cleaning teleconference was held with Centers on April 16,and non-ODC oxygen line cleaning was identified as a potential project of high interest.

f. Portable Laser Coatings Removal System (PLCRS)
ITB attended a project teleconference on June 30, 2003, to discuss the testing results to date. Testing of various portable laser coating removal systems at Wright Patterson AFB is ongoing. The first round of test panels were tested for strip rates and temperature changes in the substrate. The second round of testing will continue to refine the use and practicality of each system. A face-to-face meeting is tentatively scheduled for December 2003 in Las Vegas.

5. NASA EEE Groups

Mr. Greene will continue to provide information on the lead-free solder project and accept speaking invitations, as approved by the NASA AP2 Program Manager, Ms. Brown, to inform other NASA functions of the NASA/DOD Lead-Free Solder Project.

Previously (April 16, 2003), Mr. Greene briefed the NASA Workmanship Technical Committee on the results and conclusions of the NASA solder assessment, as well as an update of the JG-PP Lead-Free Solder project. Specific Trip reports are available upon requests. ITB believes that NWTC participants would not have a sense of urgency about developing a policy on lead-free solders and surface finishes if the AP2 Office was not regularly briefing at NWTC meetings. NASA Headquarters (Code Q) action is being taken to address lead-free concerns.

6. AP2 Financial Management Tools

ITB began to identify suitable cost benefit analysis (CBAs) methods for Agency AP2 projects. In general, CBAs will follow the JG-PP CBA Methodology, but should also be of familiar format to any NASA-accepted CBA methods.

7. Prepare AP2 Project Technology Reports

a. Potential Alternatives Reports
As soon as the five Agency AP2 projects are approved by the NASA AP2 Manager and the general technical requirements identified by the respective project stakeholders, ITB will begin preparing Potential Alternatives Reports (PARs) for the projects. The PARs will discuss the viable alternatives, the downselection process, and the alternatives ultimately recommended for testing/implementation.

b. Joint Test Protocols
As soon as the five Agency AP2 projects are approved by the NASA AP2 Manager, ITB will begin preparing Joint Test Protocols (JTPs) for the respective projects. The first step

in preparing some of these JTPs has already been initiated, which is to begin identifying the project stakeholders' technical requirements. Once the five Agency P2 projects are firmly identified, JTP preparation for specific applications will begin in earnest.

In support of the Coatings/Depainting thrust area, Mr. Andrews requested the project stakeholders provide their technical requirements for testing and validating alternatives materials and processes. Based on the telecons thus far, the group has indicated interest in the following projects.

1. Identification, testing and validation of alternatives to inorganic zinc primers in moderately and highly corrosive environments.
2. Identification, testing and validation of alternatives to Aliphatic Isocyanate Urethanes.
3. Identification, testing and validation of “newly” identified coating systems in facility applications. E.g. ICPs, IPN based coatings, low-VOC topcoats, heat-resistant coatings etc.
4. Identification, testing and validation of “new” surface preparation/depainting technologies;

The goal being to;

- *reduce the quantity of secondary waste*
- *reduce fugitive emissions and dust generation*
- *achieve an acceptable surface profile*
- *reduce and contain waste and emissions during lead paint removal projects*

Mr. Andrews has suggested that the group prepare JTP’s for the three most critical areas so that they may embark on the testing phase as soon as possible. The NASA AP2 office will commit resources to pen these documents but will of course work closely with the stakeholders in ensuring that projects or testing requirements identified reflect NASA Center requirements.

In support of the Precision Cleaning thrust area, Mr. Andrews and Mr. Kessel requested the project stakeholders provide their technical requirements for testing and validating alternatives materials and processes. The group has identified four areas of common need where benefit can be gained by engaging in a joint approach i.e. two or more centers.

PC.I. Replacement of currently used ODCs in clean-room applications
PC.II. Dem / Val of HFE 7100, Vertrel and Aqueous systems for replacement of CFC 113 in line cleaning applications
PC.III. Dem / Val of alternatives to AK 225
PC.IV. Replacement of TCE and TCA in Calibration testing

The NASA AP2 office is currently in the process of confirming stakeholder interest in each of these projects. Once stakeholder interest is confirmed, the AP2 office will ask for AP2 Program Manager approval to initiate the technical phase of the projects and begin preparing the JTP and investigate available alternatives to ensure that common Agency needs are addressed.

In support of the Convergent Spray Technology Project, Mr. Rothgeb requested technical information from stakeholders regarding testing and validation of this technology. Standards, specifications and other pertinent testing information is to be delivered to the AP2 Office prior to the next teleconference, currently scheduled for July 11. Engineers from Michoud Assembly Facility, as well as Marshal Space Flight Center were tasked to collect and send this information during the teleconference that took place on May 20, 2003. Additionally, personnel from USA-SRB will be sending information on testing and validation that took place in the past in order to qualify this system and materials to be used on the SRBs.

c. Joint Test Reports

Once testing completes on Agency AP2 projects, ITB will prepare Joint Test Reports (JTRs). The JTRs will detail the test results and provide analysis and conclusions. One of the first completed JTRs may be for the JCAA/JG-PP Lead-Free Solder project; JTR writing could begin as early as June 2004, after some short-term tests are completed and data analyzed.

C. DOD Business Entity Support

During the reporting period, ITB provided significant support to the Joint Group on Pollution Prevention (JG-PP) in its efforts to maintain environmental technology cooperation, and qualify shared alternative material and process solutions that are less or non-hazardous to the environment. Some of this support involved continuous improvement of JG-PP and identification of potential new projects, as discussed below.

1. JG-PP Working Group Support

ITB regularly supports the JG-PP Working Group through participation in teleconferences, business and technical meetings, JG-PP Principal Meetings, and Joint Logistics Commanders Meetings. Following is the ITB support provided this reporting period.

JG-PP WORKING GROUP (WG) TELECONS: Throughout this period of performance, Mr. Hill, Mr. Andrews, Mr. Greene, and Ms. Hill provided ITB teleconference support. Where noted (e.g., in specific action item comments), ITB support was assigned lead responsibility for action item resolution.

JG-PP Working Group Teleconference 4/29/03

Overall, Telecon discussions brought significant agenda items for the upcoming JG-PP WG face-to face (F2F) meeting in Washington, D.C., May 19-20, 2003. Discussions also included status of action items (AIs). A review of the agenda objectives follows:

Status of Response to the Aging Aircraft Group: Letter to be sent to Mr. Steven Manning, General Bailey's Deputy Director. When signed, the letter will be sent to the Joint Council on Aging Aircraft (JCAA) and to the JG-PP WG. No further comments or actions were noted.

Status of Army JG-PP Chairmanship Memo: Since the Army does not have funds to support the JG-PP Chairmanship for 2004, they have declined. A Memo declining the Chair was approved, but MG Deyermond would not sign. It was noted that the WG would discuss this again during the F2F meeting.

Status of Cost Model Information/ECAM: To date, the Army's point paper received no comments from the WG. Although, NASA informed the group they were reviewing the paper. It was noted that researching other CMs besides ECAM would not be worth the effort. The Army is to look at why other CMs were not looked into and cited in the point paper. The Army is briefing the WG during the F2F meeting

JG-PP WG F2F Meeting Agenda: The Navy suggested, the FY 03 Calendar of Events and Conferences be moved to the first day of the meeting. The Air Force suggested the time allowed for the LFS discussion could be reduced. The group was asked to send their read ahead material. An action was taken to send to the group before the F2F meeting the following AIs: JLC, WG, the JG-PP calendar and the project read ahead material.

New Business: Mr. John Coho replaced Lt. Col. Bruce Harding; JLC meeting was added to the F2F meeting agenda; abstracts were submitted for the following conferences: P2 HW Conference (abstract accepted), and the Aging Aircraft.

Status of AIs: The following AIs are relative to NASA AP2 involvement:

JWG.02.10.10

NASA still has not received comments from the group. Ms. Hill requested that all

comments be sent no later than May 7, 2003 so read ahead material can be prepared for the F2F meeting in May 2003.

JWG.03.01.04
Mr. Greene informed the group that there are $300K in-kind contributions from some of the OEMs. For OEMs to be informed of additional money needed, government contribution still needs to be determined. To finalize this action, the NASA AP2 is trying to meet with Mr. Assink, Air Force and the AAG.

Meeting minutes are available upon request for more specific details.

JG-PP WORKING GROUP (WG) FACE-TO-FACE MEETING, May 19-20, 2003

Ms. Christina Brown and Mr. Bob Hill attended the JG-PP WG F2F meeting, Washington, D.C. The objective of the meeting was to address the Joint Logistic Commanders (JLC) AIs, and discuss the WG level of effort to include project overview and the CONOPS. Specific Trip reports are available upon requests. A review of the agenda objectives follows:

JLC AIs #1-3 will be completed before the next JLC meeting (TBD). JLC AI #4 is closed.

Lead-Free Solder Status/Aging Aircraft Leads: Air Force reported that the JCAA plans to provide one million dollars towards the LFS project and the Air Force and NASA will provide JG-PP support.

Army Costing Models/ECAM: The WG agreed to use the new terminology, Cost and Benefit Analysis. Four metrics with selection criteria were identified for each metric: Tech transfer, economic benefits, environmental benefits and project earned value analysis. NASA is responsible for the project EVA metric.

1-N Project Discussion: The WG agreed on a sub-committee to down-select from the 14 projects. Mr. Kevin Andrews will represent NASA.

Rotating JG-PP Chair: The Army is to inquire if the new general would support the JG-PP Chair by 6/5/03. Mr. William Sugg, is leaving the Marine Corp and is not sure who will be the new rep. It was undecided who would be the next JG-PP Chairman.

CONOPS: The WG is to review and provide comment to Ms. Brown. This is a formal action.

Project Overview: Mr. Ron Patun, CTC, reviewed CTC's activities in the following projects: Lead Free Solder; Lead-Free Surface Finishes and Low-VOC Conformal Coatings (CCAMTF), Low/No-VOC and Nonchromate Coating System for Support Equipment, Low-VOC Identification Marking, and Nonchromate Primers for Aircraft Exteriors

Calendar of Events and Conferences: NASA is the lead for the Air and Waste Management Conference and the Joint DoD/FAA/NASA Conference on Aging Aircraft. All other conferences are lead by the Air Force or DCMA. The SERDP/ESTCP Conference still needs a lead.

Open Discussion: The following meetings were decided: Principals' meeting at HQ NAVAIR, Washington, D.C., 10/1/03, JLC, 11/03, WG, 9/29/03.

Meeting minutes are available upon request for more specific details.

JG-PP Working Group Teleconference 6/10/03

Overall, Telecon discussions included the status of metrics, dates for the next WG and Principals' meetings, and AIs. A review of the agenda objectives follows:

Status of Metrics: Telecon agenda will continue to discuss the status of metrics until fully developed.

Discuss date for next WG and Principals' Meeting: The Navy confirmed October 1, 2003 for their Principal. All other services and NASA need to confirm their Principals' availability. The JLC dry-run meeting is September 16, 2003 (no location was decided) and the JLC formal meeting is October 14-15, 2003. The Navy is to inquire if JG-PP will be on the JLC meeting agenda. All JLC AIs must be completed by September 16, 2003, as this is the dry-run meeting date. It was suggested the WG and Principals' meeting be moved. An action resulted from the discussion where the WG is to check with their Principals for their availability meeting dates either late August or early September. On 6/11, Ms. Hill notified Ms. Brown by email of this action.

Status of AIs: The following AIs are relative to NASA AP2 involvement:

JWG.03.06.02
WG to check with their Principal for available meeting dates in late August or early September. Lead: Ms. Christina Brown

JWG.02.10.10
Complete Principals AI #2. In progress. Lead: Kevin Andrews.

JWG.03.01.04:
LFS business meeting on 5/28/03 with NASA and JCAA. NASA is going to use its budgeted funds to procure testing materials and begin the testing phase. In-kind contributions from Boeing will also be used. Rockwell Collins will also provide in-kind contributions by building circuit boards. Lead: Brian Greene.

JWG.03.04.01
WG to review CONOPS and provide comment to Ms. Brown. Lead: Tess Hill

JWG.03.05.01
Each service to provide comments to Navy on the metrics. Lead: Brian Greene.

JWG.03.05.08
Sort the projects by thrust area then re-rank them. Distribute the new list to the group. On 6/16/03, Mr. Kevin Andrews provided the WG the amended comparison spreadsheet that reflects a single Navy contribution. Recommend action closed. Lead: Kevin Andrews

JWG.03.05.09
Finalize the selection criteria for project selection. Distribute to group. Lead: Kevin Andrews.

JWG.03.05.10
Incorporate all comments on the CONOPS and distribute to WG. Lead: Tess Hill.

Meeting minutes are available upon request for more specific details.

JG-PP Working Group Teleconference 6/24/03

Most of the discussion at this telecon was about the JLC action items, and specifically the development of PowerPoint slides to address the action items. Discussions also included the status of metrics, dates for the next WG and Principals' meetings, and AIs. A review of the agenda objectives follows:

JG-PP Metrics: By 11:00 AM June 30, Trish Hennessey Webb needs services input on draft Metrics slides that she distributed. Mr. Greene replied to the Navy with such a slide for Earned Value management at 11 AM on June 30.

JLC Action Items: Navy's opinion is that it may not be necessary to brief the JLC on the JG-PP action items, unless the JLC so requests. Recommendation is to complete the action items (PowerPoint format) noting that the action items are complete, send the file to the JLC Secretary in July or August, and ask if the Secretary can close the AIs. Such closure via correspondence would eliminate the need for the new JG-PP Principal member to brief the JLC members.

JLC AI#1: Summarize that the Army identified ECAM as the best methodology for JG-PP's purposes, coupled with other metrics that JG-PP is developing.

JLC AI#2 and #3 were also briefly discussed.

JG-PP Chair Rotation: Army is not accepting the Chair for 2003-04. However, they did not rule out accepting the Chair for 2004-05. Navy would look into US Marine Corps accepting the Chair for 2003-04.

Discuss date for next WG and Principals' Meeting: The Navy re-confirmed October 1, 2003 for their Principal. All other services and NASA need to confirm their Principals' availability. The JLC dry-run meeting for the Working Group is September 29-30, 2003 and the JLC formal meeting will be in November 2003. The Navy is to inquire if JG-PP will be on the JLC meeting agenda.

Mr. Greene verbally provided highlights of this teleconference to Ms. Brown on June 25 in San Diego.

Status of AIs: The following AIs are relative to NASA AP2 involvement:

JWG.03.01.04:
Working Group indicated to Mr. Greene that PowerPoint slide format for the business plan should be sufficient. NASA is going to use its budgeted funds to procure testing materials and begin the testing phase. In-kind contributions from Boeing will also be used. Rockwell Collins will also provide in-kind contributions by building circuit boards. Lead: Brian Greene.

JWG.03.04.01
WG to review CONOPS and provide comment to Ms. Brown. Lead: Tess Hill

JWG.03.05.01
Each service to provide comments to Navy on the metrics. Mr. Greene indicated that NASA AP2 had no comments to the metrics. Lead: Brian Greene.

JWG.03.05.09
Finalize the selection criteria for project selection. The Working Group agreed with Mr. Greene's suggestion that this AI remain open until the ad hoc projection selection subcommittee meets and finalizes project selection criteria. However, NASA AP2 Office will still distribute some initial ideas for project selection criteria. Lead: Kevin Andrews.

JWG.03.05.10
Incorporate all comments on the CONOPS and distribute to WG. Lead: Robert Hill and Tess Hill.

Meeting minutes are available upon request for more specific details.

2. Shared Outreach Activities - Conferences

The following conference is a JG-PP supported conference. This means that the cost for registration, shipping the booth to and from CTC, Johnstown, PA (where the booth is housed), exhibit space, decorations, etc. come from JG-PP Core funds.

96th Annual Air & Waste Management Association Exhibition and Conference
June 22-26, 2003
San Diego Convention Center
111 West Harbor Drive
San Diego, CA 92101

Ms. Hill accomplished the following objectives for the Air & Waste Conference:

JG-PP Booth Logistics and Security:
Ms. Hill coordinated the booth logistics and security with Ms. Gina Hudak, Conference Coordinator, CTC, on the following dates: 4/21-24/03, 5/29-30/03, 6/6/03, 6/9-13/03. The outcome of the logistics provided the following:

Registration and Security Badges:

- Ms. Brown - JG-PP exhibitor, full technical and speaker
- Mr. Greene - JG-PP exhibitor and speaker
- Mr. Kessel - JG-PP exhibitor.

Speaker confirmation:
Ms. Hill coordinated the process for Ms. Brown's briefing with Ms. Amy Klaus, Technical Programs Coordinator, Air & Waste Management Association on the following dates: 4/24/03, 5/5/03, 5/26/03, 6/6/03. The outcome resulted in the confirmed date and time for Ms. Brown's presentation: Thursday, June 26, 2003, 10:45 AM, paper #70420, "Integrating common Problems for Shared Solutions", session: EI-1i.

AWMA Children's Environmental Session:
Ms. Hill notified Ms. Brown of the potential outreach opportunity on 5/9/03. The objective of the session allows cub reporters to interview various exhibitors. The cub reporters are interested in what NASA does to help the environment, various career opportunities available and educational guidance. Ms. Brown agreed to the interview. Ms. Hill coordinated this activity with Ms. Christi Veleta, Chair, Education Council, and Air & Waste Management Association on 5/2/03 and 5/14/03. The outcome resulted in a confirmed date and time for Ms. Brown's interview: Wednesday, June 25, 2003, 9:30 a.m. - 10:30 a.m.

JG-PP Booth Handouts: On 6/6/03, Ms. Hill requested from Ms. Michele Farren, CTC, a Technology Transfer Materials Checklist. The list includes the type of JG-PP booth handout. Typically, the items include literature handouts in tri-fold format for the projects and program and assorted miscellaneous items: pens, post-it notes, and neck totes. On 6/13/03, Ms. Farren provided the checklist.

Conference Dossier for Ms. Brown:
On 6/2/03 and 6/16/03 Ms. Hill prepared a complete dossier for Mr. Brown that includes the following items:

Conference grid: Date, Time, and Event
Logistics: Presenters' Breakfast, Loading Presentation Instructions
Briefing in hard copy and CD ROM
Biography
Outline format for Cub Reporters: Thesis, talking points, and points of contact
Complete Conference daily line up
Complete conference printout

On 6/17/03, Ms. Hill met with Mr. Brian Greene and Mr. Kurt Kessel to discuss in detail the

above topics and the exhibitor's kit supplied by Ms. Gina Hudak on 6/12/03.

On 6/19/03, Ms. Hill completed Ms. Brown's briefing. Ms. Brown will speak on Thursday, June 26, 2003 at 10:45 a.m. The theme of Ms. Brown's presentation, "Integrating Common Problems for Shared Solutions" was well received.

Mr. Kessel and Mr. Greene assembled, manned, and disassembled the JG-PP booth at the Air & Waste Management Association Conference in San Diego the week of June 22. Specific Trip reports are available upon requests. In addition, on June 26, Mr. Greene delivered his "JG-PP Lead-Free Solder Project" briefing to session attendees at the Air & Waste Management Association Conference in San Diego. The presentation was well received and resulted in additional interest in the project.

Recommendations:
Ms. Hill would not recommend this conference for 2004. Beginning in January 2003, there were numerous issues with Air & Waste Management Association's technical division. The errors included difficulty in loading full technical papers: abstracts, draft manuscripts. In addition to technical errors, requesting specific information such as, abstract acceptance, speaker date and time, was also difficult in terms of trying to track someone down. It was also noted by Ms. Hudak the numerous logistical issues.

Ms. Hill further recommends conference feedback from the participants in terms conference attendance. Since the majority of the issues were from A&WM, the conference in itself may be viable for attending. Ms. Hill further recommends post-conference feedback to present to the JG-PP WG.

3. Support JG-PP Projects

ITB provided technical support to the two key JG-PP projects noted below. ITB acted as the liaison to assure NASA requirements are being incorporated and to facilitate technology migration.

a. Coatings for Support Equipment

Mr. Kurt Kessel provided technical support to the active Low/No-VOC and Nonchromate Coating System for Support Equipment (Project Number: J-99-OC-014) project and acted as the NASA liaison.

Mr. Kessel participated in the May 8, 2003 project teleconference. The main topic of discussion was the scheduling of the final support equipment site visits scheduled for the weeks of June 8 and June 15.

On June 12, Mr. Kessel escorted the field evaluation team on a final site visit of three generator carts at Cape Canaveral Air Force Station. This inspection concluded the field-testing and observation portion of the project.

Testing for the Support Equipment project included the testing of panels by NASA-KSC Beach Corrosion Test Site. In-order for the new coatings to be qualified for NASA use they must meet NASA-STD-5008, **"***Standard for Protective Coating of Carbon Steel, Stainless Steel, and Aluminum on Launch Structures, Facilities, and Ground Support Equipment*". Data results from the KSC Beach Corrosion Test Site were provided to the NASA AP2 Office on June 3, 2003.

Coatings from this project, which are approved for NASA use, include the Ameron D-9HS and Devoe 304H non-topcoated coatings and the Ameron D-9HS/PSX700 coating system. These coatings and coating systems must continue to perform at this level for 5 years (60 months) to remain on the approved topcoat list in NASA-STD-5008.

- The NASA AP2 Office should incorporate the results from this project into the Non-hazardous materials/processes in coating and depainting project currently being lead by Mr. Kevin Andrews.

- The NASA AP2 Office should become an active participant in Low/No VOC Corrosion-preventive Coatings for ICBM Missile Support Equipment project currently being lead by the Air Force.

b. Portable Laser Coating Removal

The only project teleconference scheduled for this reporting period was to take place in June 2003. However, this teleconference was postponed to a later (undetermined) date. A face-to-face meeting is scheduled for December 2003 in Las Vegas.

4. Coordinate JG-PP Projects

a. Lead-Free Solder

The major focus this reporting period was the coordination of business activities necessary to identify and place on contract funds for procuring testing materials for the JCAA/JG-PP Lead-Free Solder project.

1) Technical Coordination

Mr. Greene and Mr. Kessel prepared for and facilitated two major project teleconferences this reporting period, on April 21 and June 17. The objective of the April 16 teleconference was to: discuss the Joint Council on Aging Aircraft (JCAA) new role in leading the project; review the test flow sequence and timetable for 2003-2004; review the latest testing cost estimate and cost share figures; compare the Lead-Free Solder Joint Test Protocol (JTP) with industry standards IPC-785 and IPC-9701; and propose facilities to perform the testing. Several old action items were closed.

The objective of the June 17 teleconference was to: review final comments received on the JTP, and discuss the status and open issues associated with the acquisition of materials and services needed for testing. A variety of specific technical issues were discussed, and for the most part, resolved, such as:

Components & Characterizations

- X-Outs. Propose to obtain x-outs or coupons from the raw test board manufacturing
- Microsectioning. Need for it. How many to do? Propose one microsection for each of 10 component types.
- Lead Contamination. Want to know how much lead remains on the boards when performing the rework procedures, correct? Boeing-PW procedure involves cutting the solder joints from the board, dissolving the solder joints in acid, then use ICP spectroscopy to analyze the solution. This test could be done on excess boards that undergo rework procedures. Additional cost would be about $4,800.
- SIR Test & Number of IPC Coupons. Because of the different solders formulations and soldering methods, we're ending up with a variety of solder vendors There will be multiple fluxes on each test vehicle for the various lead-free solders. Need to correct number of coupons for SIR. Propose 45 (10 per each lead-free solder FLUX TYPE) instead of 35.
- If & how to attach hybrid? M.Stibitz, Raytheon/F-15, says adhesive needed. Which one to use?

Solders & Fluxes

- Obtaining Solders. Boeing-Irving is to see what solders we can obtain from vendors at no cost to project. Also determining how much solder we need.
- Fluxes. Woodrow determining exact fluxes needed. In general, go with fluxes recommended by the vendors providing the solder. Four (4) vendors right now are Hereaus, Vitronics-Soltec, Indium, and Senju. Propose go with no-clean fluxes and do not clean
- Stencil. Need to apply solders, but PbF solders don't spread same as SnPb. How thick to make stencil? What size aperture in stencil?

- PbF Wave Solder Alloy. Clarification, proposing using a "stabilized" Sn0.7Cu. Product comes from Nihon Superior. At least three reasons: (1) Stabilized offers better performance—wets better, looks better. (2) Vendor (Vitronics) only uses stabilized SnCu. So they are familiar with it. (3) Being used very widely (400 institutions globally). In conclusions, stabilized SnCu reduced unknown variables.

It was also agreed at the June 17 teleconference that ITB would incorporate some minor revisions to the JTP and get it ready for posting to the JG-PP Web site.

2) Business Coordination

One important piece of information to complete the business plan—i.e., what will be the Air Force's contribution and when will it be received—was determined at a May 28 Government business meeting attended by NASA (Christina Brown, Brian Greene, Kurt Kessel) and the U.S. Air Force Aging Aircraft Division (MSgt Rich Hricko, Terry Tucker, Warren Assink, Candace Reeves, Denny Jarvi). Specific Trip reports are available upon requests. In short, USAF has no FY03 money. So NASA agreed to pick up all of the project's FY03 costs (not already being donated as in-kind). NASA also agreed to fund the FY04 mechanical shock testing that Boeing Phantom Works (Wash.) would like to perform, to write the Joint Test Report, and continue project integration. This all assumes that USAF will come up with the approximately $500K shortfall required to complete the testing phase of the project. Ms. Brown and MSgt. Hricko agreed that Mr. Greene and Mr. Kessel should remain as the project integrators for at least the procurement and board-build phases of the lead-free solder project.

In preparation for the May 28 Government business meeting, Mr. Kessel and Mr. Greene developed a number of Cost Summary Sheets for all the work required during the procurement and testing phase. These sheets provide the details of the cost quotes (or engineering estimates) made in determining project testing costs.

3) Test Coordination

In addition to the two major project teleconferences in April and June, Mr. Greene and Mr. Kessel set up and facilitated at least three conference calls with technical representatives from Boeing and Rockwell Collins to address selection of testing sites, subcontract agreements, and project schedule, as discussed below.

a) *Selection of Testing Sites*

Mr. Kessel and Mr. Greene worked to pin down the sites most interested and capable of performing the lead-free solder testing. These recommendations were reviewed and approved (no opposition was voiced) at the April 21 teleconference.

One development this reporting period was the addition of a new stakeholders—Boeing-Anaheim—who has also agreed to purchase some test coupons and to donate their services for free to perform one of the JTP's extended tests (Surface Insulation Resistance, or SIR).

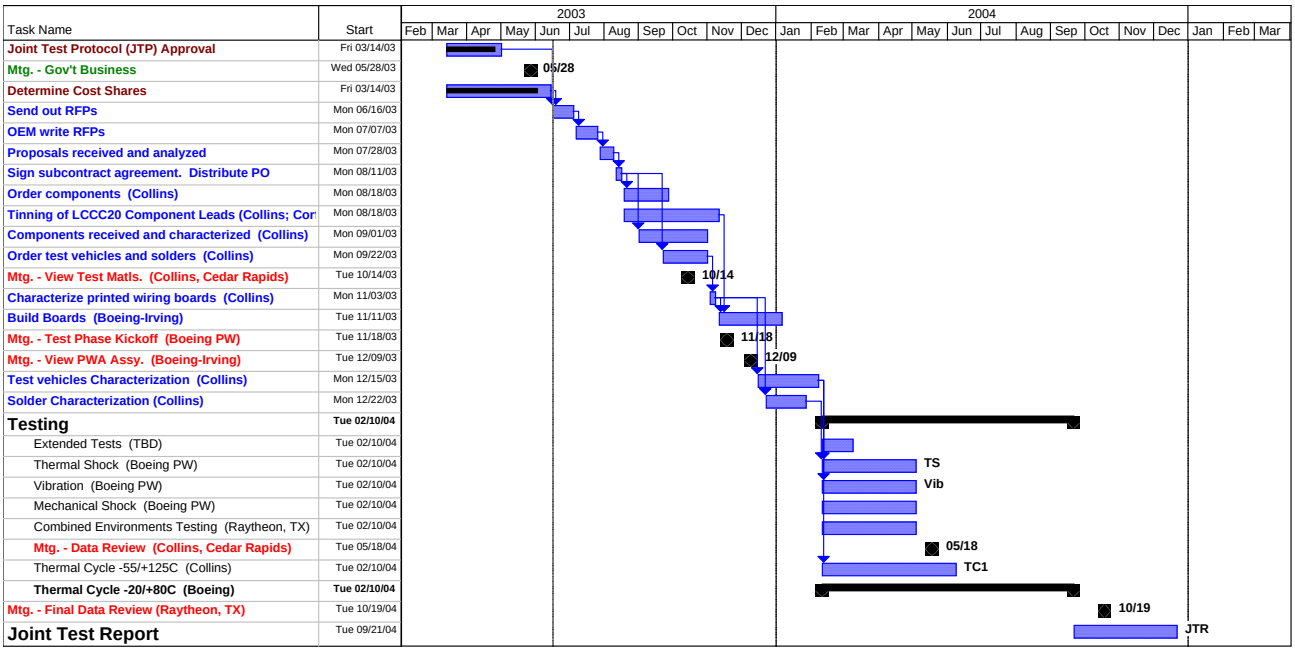
b) *Subcontract Agreements*

Mr. Kessel and Mr. Greene worked with several project representatives, especially Dave Hillman, Rockwell Collins, to obtain the details of the components, boards, and solders to be acquired for testing, and determine the cost to the Government (NASA) in procuring these. These details were passed on the Mike Dooley at ITB Headquarters for his use in developing a purchase order for Rockwell Collins to procure all the materials for testing.

c) *Preparation of Project Schedule*

Mr. Kessel and Mr. Greene continued to update the project schedule (in MSProject) throughout the reporting period. Tentative project meeting/ OEM site

visit dates were also established. This schedule is kept up to date at all times as new information is received. Below is the latest project schedule as of June 13.



5. Evaluate 15 New JG-PP Projects

Through several specific JG-PP Working Group action items (JWG.02.10.09, JWG.02.10.10, JWG.03.05.08) and decisions, Kevin Andrews and Brian Greene have been assisting the WG in identifying and evaluating potential new P2 projects.

Just prior to the start of this Task Order #1, ITB proposed to the WG revisions to Appendix C of the JG-PP Concept of Operations (CONOPs) to provide more detail and direction on how new project identification and evaluation should occur. At this time, JG-PP was effectively at "Step 2" of the methodology, with the next step being a detailed scoping of potential projects within these areas to identify actual projects.

As a "test" of the newly revised JG-PP methodology, the NASA AP2 Office began analyzing the P2 needs submitted by the services. Specifically, in addressing action item JWG.02.10.10, and based on the submittals received in response to JWG.02.10.09, Mr. Andrews constructed a potential project comparison table in Microsoft Excel. This table was distributed to the WG on April 14, 2003. The table included the 1-n highest P2 priorities of the respective services. To confer consistency, the NASA AP2 office assigned a weight based on a 5 - 1 scale which attempts to address the importance of the P2 need and incorporate variables like maturity of alternative technologies/industry and environmental impact.

In a follow-on action item to AI JWG.02.10.10—AI JWG.03.05.08—Mr. Andrews updated the comparison table to reflect comments from the WG. An update to the table was distributed on June 9, and a further amended table again on June 10.

6. JG-PP Financial Management Tools

ITB was tasked to take the lead in helping JG-PP incorporate earned value management (EVM) techniques into JG-PP's methodology.

During the JG-PP Working Group meeting, 19-20 May 2003, it was noted that NASA contributions to the LFS project were not shown on the project status sheet. AI JWG.03.05.11 was assigned for Ms. Crocco, CTC to contact Ms. Brown to obtain the funding

levels that NASA has provided. Once received Ms. Crocco will update the funding workbook and send the revision to the WG. Upon receipt, Ms. Hill and Mr. Greene will review the revised workbook for disparities.

On 6/16/03, AI JWG.03.05.11 was completed by Mr. Greene, Mr. Kessel, and Ms. Hill. On behalf of Ms. Brown, Ms. Hill submitted NASA's response to CTC.

JWG.03.05.11
Date Due: June 20, 2003
Responsibility: Ms. Tamara Crocco, CTC
Required Action:
Ms. Crocco will contact Ms. Brown to obtain the funding levels that NASA has provided for development of the LFS project and Ms. Crocco will update the funding workbook.

Comments:
6/16/03 – On behalf of Ms. Brown, Ms. Hill submitted requested financial information to Mr. Ron Patun and Ms. Tamara Crocco.

6/24/03 – At the JG-PP Working Group Telecon, Ms. Crocco reported that she had updated the LFS funding tables with the figures NASA provided.

D. International Business Entity Support

During the reporting period, ITB supported the Portuguese Institute of Environment and Centro Para Prevenção da Poluição – C3P (English translation: Center for Pollution Prevention) under the NASA/Portugal Joint Statement (JS) and the Terms of Reference (TOR). C3P is the AP2 counterpart organization in Portugal. Significant ITB efforts were expended this reporting period establishing C3P as a viable program.

1. Program Support

During this reporting period Mr. Hill provided an extensive amount of support in working programmatic efforts between the NASA AP2 Program and the C3P, who is on behalf of the Portuguese Institute of Environment (IE). The level of support included development, coordinated response(s), and distribution to the following Program and Administrative Support:

Prepared, coordinated, finalized, and distributed the meeting minutes from the NASA-IE meeting on Feb 26-27, 2003.

NASA-IE Meeting Action Items:
C3P.03.02.01 Mr. Hill developed and distributed C3P CONOPS for coordination by General Branco among the C3P members. General Branco responded that with minor comment, the contents of the CONOPs had been accepted by the C3P members. Comments were included and this action item was closed.

C3P.03.02.03 Mr. Hill provided email files to complete his response to action item C3P.03.02.03, to provide to Gen. C. Branco regarding JG-PP coatings project information for Branco to disseminate. His efforts included other briefings for distribution to Institute of Environment. This action was recommended for closure.

C3P.03.02.04 Mr. Hill developed and distributed Goals for C3P tasks. General Branco responded that general agreement on by the members of C3P was in total concurrence. General Branco further identified that Organizational responsibility-- environment and safety integration to be done by both I NEGI and ISQ, according to Project primary responsibilities. It was noted that ISQ has in it structure specific departments dedicated to Safety and Occupational Health (this is also the field of expertise of Ms Mariana Pereira who, altogether other Portuguese scientists whom C3P can mobilize if absolutely necessary). Info networks, sharing programs on US-EU regulations, etc.-- ISQ, INEGI and of course the

Ministry of Environment will provide the indispensable support.

C3P.03.02.05 Mr. Hill developed the schedule of events in MS Project 2000 for the planned Technical Workshop scheduled for Sept 19th and the Joint Oversight Group Meeting scheduled for Sept 22nd of this year. He distributed and coordinated the MS Project Plan between NASA and the C3P. Comments were incorporated and the schedule/events were accepted and are now being tracked.

2. Administrative Support

In addition to the administrative support provided in the above action items during this status report period, Mr. Hill prepared and coordinated a draft letter for General Branco to provide to the Secretary General of AECMA regarding introduction of C3P for the Paris Air Show. In support of this event, Mr. Hill also developed a draft handout on C3P for General Branco to take and distribute at the Paris Air Show.

Mr. Hill drafted the Office of Naval Research International Field Office, Conference Support Program (CSP) application for General Branco, C3P, to acquire financial assistance for the Portuguese Institute of Environment/Centro Para Prevenção da Poluição – C3P/NASA Environmental Technical Workshop scheduled for 19 September in Lisbon.

3. Identify International Needs

Mr. Hill, in conjunction with Engineers Andrews and Rothgeb, performed desktop review and analysis of three Portuguese project interests involving VOCs, Heavy Ions, and polymer concrete. NASA AP2 contractor support engineers have provided review and analysis of these project interests. Currently, Engineers Anderson and Rothgeb are seeking NASA interests at the Centers to determine applicability.

4. Prepare C3P Letters of Agreement

Prepared a draft letter and general protocol for coordination between BAE Systems and C3P, similar to the one needed for specific projects between NASA and Portugal. Goal is to embed consistency in format and content for C3P general and specific teaming and project agreements similar to NASA's agreements. This should enable quicker acceptance by NASA HQs Code I should the need occur.

5. Coordinate C3P Projects

Mr. Hill, in conjunction with Engineers Andrews and Rothgeb, coordinated preparations and schedule for NASA AP2 engineers' assessment visit to Portuguese SME and Industry interests in support of IE and C3P. Approximately 15 painting and metal works technology application sites are to be visited in and around the Lisbon and Porto areas in late June and early July. Details of these site visits will be reported in the next ITB Status Report.

6. C3P Financial Management Tools

During this reporting period no financial management tools were developed. This status will remain pending the formal start of joint NASA/Portuguese P2 projects.

7. Migration of NASA & DoD Technologies to C3P

Two technology opportunities were provided by contractor support during this status reporting period to the IE, via the C3P, for consideration. First, the Emission Elimination Devices, to reduce chrome emissions from chromic acid anodizing and chrome plating processes preformed at industrial facilities across Portugal. Through the introduction of emission elimination device technology, chrome emissions can be greatly reduced in various industrial sectors for both functional and decorative activities. Second technology was the Low/No VOC Coating Systems to reduce VOC emissions from coating processes preformed at industrial facilities across Portugal. Through the introduction of low/no VOC coating systems technology, VOC emissions can be greatly reduced in various industrial sectors for both new manufacturing and refurbishing activities. Both suggested technology opportunities found favor in Portugal and are being added to the project development and stakeholder identification process in preparation for the Technical Workshop scheduled for Sept 19, 2003.

8. C3P Action Item Tracking Tool

During this reporting period an action item tracking system was developed and implemented by Ms. Hill for the six action items initiated from the previous NASA/IE Meeting. Multiple correspondences by email and telecomm were prompted from this tracking methodology.

9. C3P Information Management Systems

During this reporting period, the contractor provided initial development of the C3P Web site. The contractor received edits and comments and made adjustments accordingly. Initial development of the website by ITB is complete. ITB will provide maintenance and updates to this website as provided by the C3P Director General, or other appointed C3P representatives and as required labor is approved by the NASA AP2 Program Manager, Ms Christina Brown.